

Interferometric Optical Filter at 532 nm for Improved Atmospheric and Ocean Measurements with HSRL

Completed Technology Project (2017 - 2018)



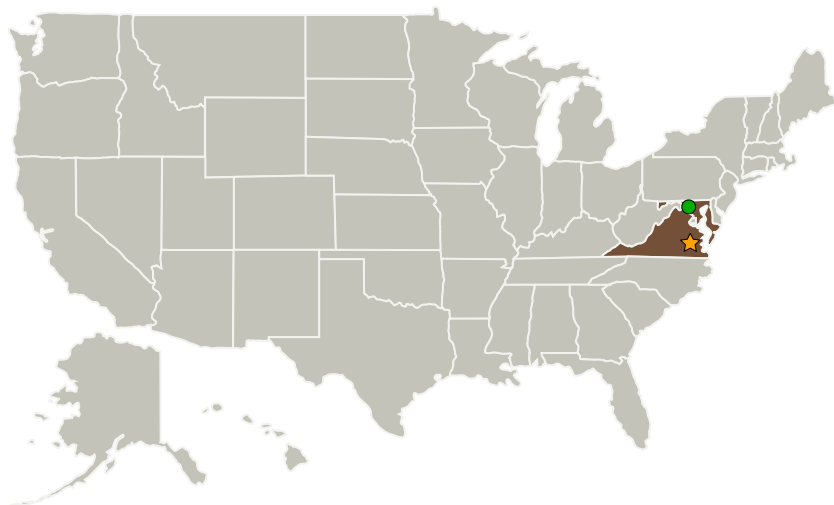
Project Introduction

Research will begin with selection and testing of candidate materials' thermal properties and optical properties (NASA Goddard's CHARMS facility). #In parallel, a Structural-Thermal-Optical-Performance (STOP) model of the interferometer will be made to determine the best structural-thermal-optical design. #Based on the STOP-optimized design and the sample material thermal and optical data, the component arms of the interferometer will be manufactured to nearly their final lengths, and then measured for Coefficient of Thermal Expansion (CTE) using ASTM-E289. #An engineering test unit will be built based on these results, and it will be tested in the Photonics lab for thermo-optical performance/stability and contrast ratio

Anticipated Benefits

Benefit to scienc mission directorate. This technology would provide the opportunity for LaRC to lead the development of a spaceborne lidar, as was recently called for as a directed mission in the 2017 Decadal Survey for Earth Science and Applications from Space.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★ Langley Research Center (LaRC)	Lead Organization	NASA Center	Hampton, Virginia
● Goddard Space Flight Center (GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
LightMachinery Inc	Supporting Organization	Industry	Ottawa, Outside the United States, Canada
Precision Measurements and Instruments Corporation	Supporting Organization	Industry	

Primary U.S. Work Locations

Maryland

Virginia

Project Transitions

October 2017: Project Start

 September 2018: Closed out

Closeout Summary: Design and test an optical filter that can enable more accurate and efficient High Spectral Resolution LiDAR (HSRL) at 532 nm to improve measurements of aerosols/particulates in the atmosphere and in the ocean.

Project Website:

https://www.nasa.gov/directorates/spacetech/innovation_fund/index.html#.VC

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Center Innovation Fund: LaRC CIF

Project Management

Program Director:

Michael R Lapointe

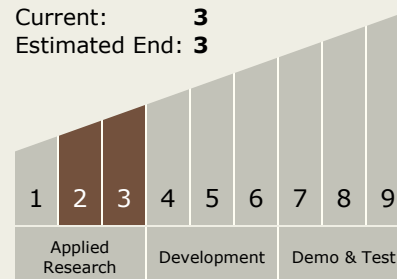
Program Manager:

Julie A Williams-byrd

Principal Investigator:

Shane T Seaman

Technology Maturity (TRL)

Start: **2**Current: **3**Estimated End: **3**

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Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.3 Thermal Protection Components and Systems
 - └ TX14.3.1 Thermal Protection Materials

Target Destination

Earth